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EXAMINER	
RHEE, JANE J	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/524,665
Filing Date: February 11, 2005
Appellant(s): HENNIGE ET AL.

Oblon, Spivak, McClelland, Maier and Neustadt P.C.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 7/7/08 appealing from the Office action mailed 4/14/08.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6287720	Yamashita et al.	9-2001
6299778	Penth et al.	10-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-12,30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamashita et al. in view of Penth et al. (6299778).

As to claims 1,30-31 Yamashita et al. discloses a separator electrode unit capable of function in a lithium battery as a separator electrode unit, the unit comprising a porous electrode and a separator layer applied to the porous electrode (col. 8 lines 5-9), wherein the separator electrode unit comprises an inorganic separator layer (col. 6 lines 59).

Yamashita et al. fail to disclose wherein the inorganic separator layer comprises at least two fractions of metal oxide particles which differ from each other in their average particle size and/or in the metal the separator layer comprising metal oxide particles having an average particle size (D.sub.g) which is greater than the average pore size (d) of the pores of the porous electrode that are adhered together by metal oxide particles having a particle size (D.sub.k) which is smaller than the pores of the porous positive electrode.

Penth et al. teaches an inorganic separator layer which comprises at least two fractions of metal oxide particles which differ from each other in their average particle size and/or in the metal (col. 5 lines 1-7), the separator layer comprising metal oxide particles having an average particle size (D.sub.g) which is greater than the average pore size (d) of the pores of the porous electrode (col. 4 lines 65-67 and col. 4 lines 16-17) that are adhered together by metal oxide particles having a particle size (D.sub.k) which is smaller than the pores of the porous positive electrode (col. 4 lines 65-67, col. 4 lines 16-17) for the purpose of providing a permeable composite that can be produced simply at a reasonable price (col. 2 lines 3-15).

Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide, Yamashita et al. with an inorganic separator that comprises at least two fractions of metal oxide particles which differ from each other in their average particle size and/or in the metal the separator layer comprising metal oxide particles having an average particle size (D.sub.g) which is greater than the average pore size (d) of the pores of the porous electrode that are adhered together by metal oxide particles having a particle size (D.sub.k) which is smaller than the pores of the porous positive electrode in order to provide a separator that can be produced simply at a reasonable price.

As to claim 2, Penth et al. teaches wherein the separator layer has a thickness (z) which is less than 100 D.sub.g and not less than 1.5 D.sub.g (col. 7 lines 36-38).

As to claim 3, Penth et al. teaches wherein the separator layer has a thickness (z) which is less than 20 D.sub.g and not less than 5 D.sub.g (col. 7 lines 36-38)

As to claim 4, Penth et al. teaches wherein the metal oxide particles having an average particle size (D.sub.g) which is greater than the average pore size (d) of the pores of the porous positive electrode are Al.sub.2O.sub.3 and/or ZrO.sub.2 particles (col. 4 line 54).

As to claim 5, Penth et al. teaches wherein the metal oxide particles having an average particle size (D.sub.k) which is smaller than the average pore size (d) of the pores of the porous positive electrode are SiO.sub.2 and/or ZrO.sub.2 particles (col. 4 line 54).

As to claim 6, Penth et al. teaches, wherein the metal oxide particles having an average particle size (D.sub.g) which is greater than the average pore size (d) of the pores of the porous positive electrode have an average particle size (D.sub.g) of less than 10 .mu.m (col. 4 line 67).

As to claim 11, wherein the unit is bendable down to a radius of 50 cm without damage, since Penth et al. teaches the same material for the separator-electrode unit desired by the applicant, it is inherent that the unit is bendable down to a radius of 50 cm without damage.

Penth et al. teaches separator electrode unit described above for the purpose of providing a catalytically active composite that can be produced in a simple an economical process (col. 2 lines 3-7).

Therefore, it would have been obvious to one having ordinary skill in the art at the time applicant's invention was made to provide, Yamashita et al. with the separator layer has a thickness (z) which is less than 100 D.sub.g and not less than 1.5 D.sub.g, a

thickness (z) which is less than 20 D.sub.g and not less than 5 D.sub.g, wherein the metal oxide particles having an average particle size (D.sub.g) which is greater than the average pore size (d) of the pores of the porous positive electrode are Al.sub.2O.sub.3 and/or ZrO.sub.2, wherein the metal oxide particles having an average particle size (D.sub.k) which is smaller than the average pore size (d) of the pores of the porous positive electrode are SiO.sub.2 and/or ZrO.sub.2 particles, wherein the metal oxide particles having an average particle size (D.sub.g) which is greater than the average pore size (d) of the pores of the porous positive electrode have an average particle size (D.sub.g) of less than 10 .mu.m and wherein the unit is bendable down to a radius of 50 cm without damage in order to provide a catalytically active composite that can be produced in a simple an economical process (col. 2 lines 3-7) as taught by Penth et al.

As to claims 7-10, Yamashita et al. discloses a battery wherein the separator layer comprises a coating with shutdown particles which melt at a desired shutdown temperature (col. 5 lines 24-34), wherein the shutdown particles have an average particle size (D.sub.w) which is not less than the average pore size (d.sub.s) of the pores of the porous separator layer (col. 7 lines 47-51) and that the shutdown particle layer has a thickness (z.sub.w) which ranges from about equal to the average particle size of the shutdown particles (D.sub.w) up to 10 D.sub.w (col. 7 lines 52-55) and wherein the separator layer has a porosity of from 30 to 70% (col. 8 lines 32-35).

(10) Response to Argument

In response to appellant’s argument that since Yamashita et al. requires an organic binder in the separator, the combination of Yamashita et al. and Penth et al. would not present the presently claimed invention which requires an inorganic separator layer, Yamashita et al. teaches a separator comprising inorganic particles and a binder in the amount of 1/500 to 5/3, therefore can be defined as an inorganic separator because the separator can consist of mostly inorganic particles and because the applicant claimed that the inorganic separator *comprises* at least two fractions of metal oxide particles that differ from each other in particle size or in the metal which is not limited to consisting only metal oxide particles. Furthermore, Yamashita et al. discloses that it is preferred that the separator comprises a binder and not required (col. 7 line 56).

In response to appellant’s argument that since Penth et al. discloses and suggest nothing about a lithium battery, one skilled in the art would not look to the battery art to solve any problem associated with Penth et al., Penth et al. teaches components of a battery such as cathode, anode and separator (col. 11 lines 26-29 and col. 1 line 22) therefore one skilled in the art would associate theses components with a battery. Especially since Penth et al. teaches that by connecting the composite as a cathode, the catalytically reductive effect of the composite can be used and by connecting the composite as an anode the catalytically oxidative effect of the composite can be used.

In response to appellant's argument that there is neither disclosure nor suggestion that the catalytically active composite material of Penth et al. would have any utility in combination with electrode to form a separator electrode unit capable of

functioning in a lithium battery as a separator electrode unit, Penth teaches that the composite material can be used as a catalytically active membrane electrode (abstract) thus the composite material would have utility in combination with electrode capable of functioning in a lithium battery.

In response to appellant's argument that Yamashita et al. suggest nothing with regard to a coating as part of their separator layer, let alone a coating with particles having the capability of performing a shutdown function, Yamashita et al. discloses at least one layer of an aggregate form of particles of at least one insulating substance, therefore there can be two layers of particles on the separator wherein one layer can be considered the coating with particles having the capability of performing a shutdown function since Yamashita et al. discloses the same particles desired by the applicant to perform the shutdown function.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Jane Rhee/

Examiner, Art Unit 1795

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